



MICROLIGHT TYPE ACCEPTANCE DATA SHEET (TADS)

NO: BM0-34 ISSUE: 2

(6) POWER PLANTS

Designation	Dragon 150 or Dragon 200      1	Dragon 150 or Dragon 200      2	Dragon 150 or Dragon 200      3	Dragon 150 or Dragon 200      4	Dragon 150 or Dragon 200      5
Engine Type	Fuji Robin EC44PM Inv'd	Fuji Robin EC44PM Inv'd	Rotax 503 Inverted	Rotax 503 Inverted	Rotax 503 Inverted
Reduction Gear	3.3:1	3.3:1	2.72:1	3.5:1	3.33:1
Exhaust System	Nicklow	Nicklow with VW aft muff'r	Rotax	Rotax with after muff'r	Rotax with after muff'r
Intake System	-	-	-	-	-
Propeller Type	Newton 2- bladed laminated wood	Newton 2- bladed laminated wood	Newton 2- bladed laminated wood	Newton 2- bladed laminated wood	Newton 2- bladed laminated wood
Propeller Dia x Pitch	72" x 42"	72" x 42"	72" x 42"	72" x 42"	72" x 42"
Noise Type Cert No.	42M	42M	112M	42M	112M

Noise requirements:

	<u>1 Seat</u>	<u>2 Seat</u>	<u>BCAR Reference</u>
<u>Registered Pre 1/4/86</u>	<u>80 dBE</u>	<u>84 dBE</u>	<u>N3-6, 3 Iss 4</u>
<u>Registered Post 1/4/86</u>	<u>76 dBE</u>	<u>80 dBE</u>	<u>N3-6, 4 Iss 4</u>

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(7) MANDATORY LIMITATIONS: (\* indicates which are placarded)

- \*(a) Max Take-off Weight: 384 kg
- \*(b) C G Limits: 926mm to 1026mm aft of datum.
- (c) C G Datum: Forwardmost transverse mush head bolt on the top fuselage longeron.

Note: standard crew location is at 840 mm aft of datum.

- \*(d) Cockpit Loadings
 

	<u>Front</u>	<u>Rear</u>	<u>Total</u>
Pilot or Ballast (min)	55 kg	- kg	55 kg
Pilot or Ballast (max)	180 kg*	- kg	180 kg*

\*Maximum is subject to payload based upon maximum take-off weight, less actual empty weight of individual example and less full fuel; placard to be adjusted to this. See also Note under c.g. datum in (c) above.

- (e) Permanent Ballast, Weight and Position: Not fitted.
- (f) Empty C G: 1030 mm aft of datum
- \*(g) Never Exceed Speed: 63 knots
- \*(h) Manoeuvring Speed: 40 knots
- \*(i) Manoeuvre Limitations: Aerobatics prohibited.  
Roll limit <60° bank
- \*(j) Fuel Contents (Max Usable): 27 litres
- (k) Power Plant: See Table below

ENGINE	Fuji Robin	Rotax 503		
Max RPM	7000	6800		
Max CHT	280°F	250°C		
Max EGT	-	-		
Fuel Spec	4 star Petrol/oil	4 star Petrol/oil		
Engine Oil Spec	Mineral base 2 stroke	Self mix 2 stroke		
Gearbox Oil Spec	N/A	N/A		
Fuel/Oil Mix	40:1	50:1		
Oil Pressure	N/A	N/A		
Oil Temp	N/A	N/A		
Coolant Temp	N/A	N/A		

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(8) INSTRUMENTS REQUIRED FOR TYPE ACCEPTANCE:

<u>ASI</u>	<u>Altimeter</u>	<u>RPM</u>	<u>CHT</u>	<u>Compass</u>	<u>EGT</u>	<u>Coolant Temp</u>
Required 0 to >65 kt or equivalent	Required	Required	Required	N/A	N/A	N/A

(9) CONTROL DEFLECTIONS (3-AXIS SYSTEMS):

<u>Pitch Control</u>	Up: 25°	Down: 12°
<u>Tailplane Trim</u>	N/A	
<u>Ailerons</u>	Up: 18°	Down: 18°
<u>Rudder</u>	Left & Right: set to clear 25 mm of elevator, see manual.	
<u>Steering</u>	Left & Right: tailwheel follows rudder.	
<u>Spoilers</u>	N/A	

(10) PILOT'S NOTES, MAINTENANCE MANUALS REFERENCES:

Dragon Pilots Manual and Maintenance Manual.

(11) MANDATORY MODIFICATIONS/SERVICE BULLETINS/AIRWORTHINESS DIRECTIVES, ETC

See Appendix 1

(12) OPTIONAL MODIFICATIONS

Enlarged fin, ref W Brooks, Dragon Modifications, G-MMPR drawing.  
Ceconite covering of ailerons, and tail surfaces in place of original Dacron cover,  
to Ceconite specification for application system and materials.

(13) MINIMUM PERFORMANCE AT \_\_\_ kg T/O WEIGHT:

Rate of Climb: 300 ft/minute

Climb Speed: 30 knots IAS

Stall or Minimum Flying Speed: 21 knots IAS (idle power)

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Note: Drawings and/or colour photographs illustrating the principal features of the aircraft described herein, shall be attached to, and form part of, this Data Sheet.

Issue  
Authorisation

Date

For BMAA

1 BMAA

17 December 1993

P. F. Owen

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### APPENDIX 1.

#### INTRODUCTION

This Appendix is provided to highlight certain matters which relate to the conditions on which the acceptability of the Dragon 150 and 200 are based in so far as they affect compliance with the nominated airworthiness requirements. Other information is also provided in order to assist in the provision of additional information.

#### ADDITIONAL INFORMATION

##### Design standard:-

The Dragon is not fully defined by the submissions available to the BMAA, however many components and their basic specifications are given in drawing D00 - A10, issued by the designer and this is lodged with the BMAA and summarised in document FS 005. With the issue of this Type Acceptance Data Sheet (TADS), document FS 005 is no longer a required reference for the issue of a permit to fly but may be used for reference. Additional information about the design features is also given in the Dragon Maintenance Manual.

##### Notes regarding the Dragon 150 and Dragon 200:-

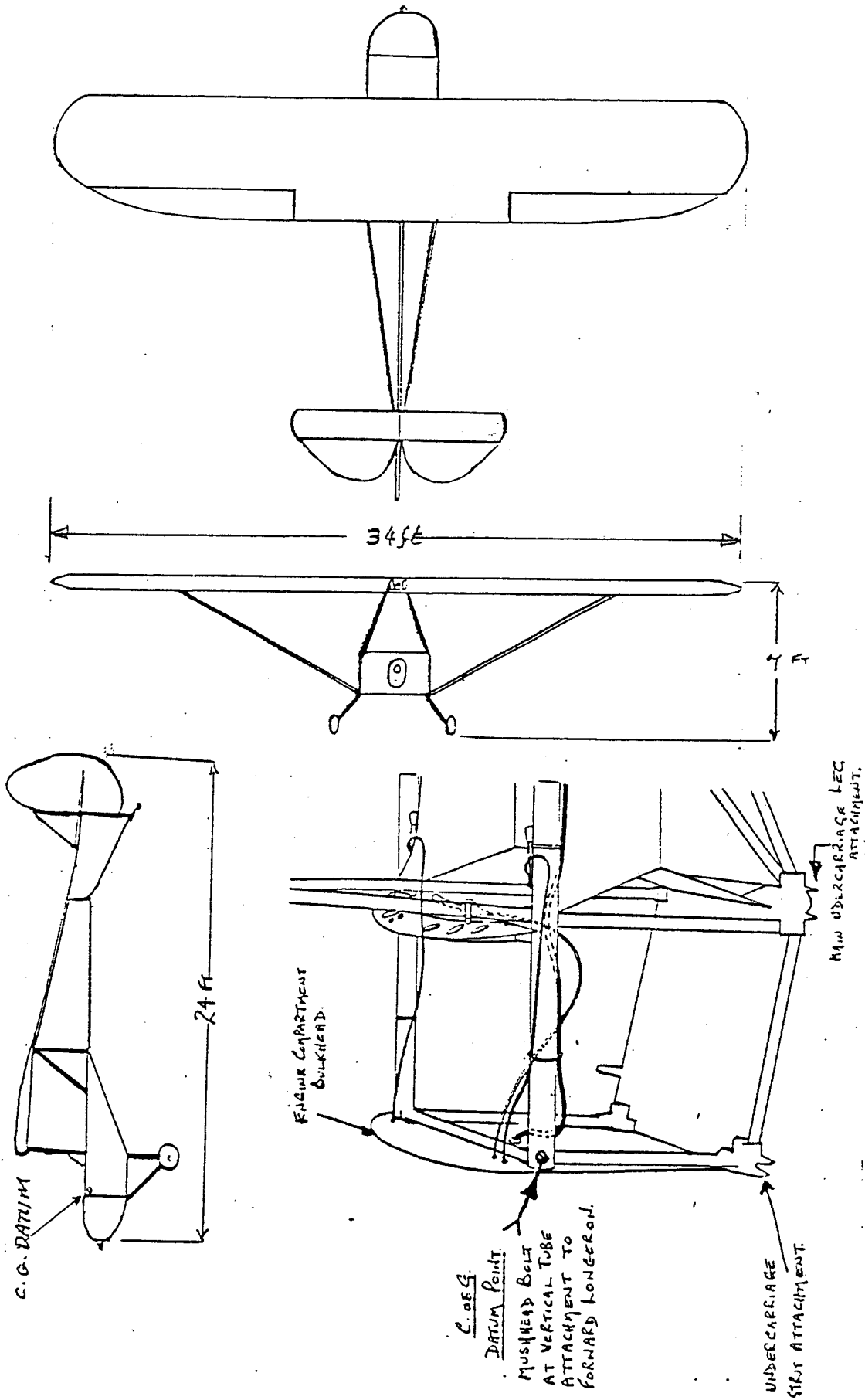
The Dragon 150 is a lightened version of the Dragon 200; however, the structural load carrying capability of *both* types is based upon the design of the lighter Dragon 150 and therefore since the maximum load capability of the Dragon 150 and 200 is the same, no significant difference exists, subject to the limitations of loadings and c.g.

#### ESSENTIAL INFORMATION & REQUIRED MODIFICATIONS

- (i) Inspection and Flight Test personnel are required to familiarise themselves with the loading and c of g limits and to check these for each individual aeroplane. In accordance with the result, and the limitations given in this TADS, placards to indicate correct loading for each individual aeroplane must then be produced.
- (ii) A record of the c.g. loading results for each aeroplane is to be recorded and retained with the aeroplane's documents.
- (iii) Particular attention is to be paid to those variants fitted with electric start and other features which may add weight forward of the firewall. Any changes made to the aeroplane, particularly of this nature must be followed by such a c.g. weight report and record and show compliance with the limits quoted in this TADS.
- (iv) Fire protection:
  - (a) Certain original examples of the Dragon 150 have limited firewall protection, due to the lighter build. It should be noted that these must have been modified to at least a fire resistant standard, e.g. by use of HS30 or L72 sheet alloy for the entire engine/cockpit fire wall position.
  - (b) In addition, fire resistant fuel line is to have been used in place of any non-fire resistant material, in accordance either with normal aviation practice or in accordance with BMAA document TIL Series No. 0007.

#### INSPECTION

Inspectors attention is drawn to the above points which require their attention and, in addition, Inspectors must pay attention to the relevant "Spotlight" and Defect Warning reports in the BMAA Inspectors' Manual and any bulletins and other information issued for the type or which affect its components. Refer also to Appendix 3.



**INSPECTION & FLIGHT TESTING NOTES:-**

1. General

- 1.1 Engine mountings may vary, there should be four sets of tubes. There should be two rear engine mounting tubes, giving some redundancy.
- 1.2 150 had inadequate firewall. See Appendix 1.
- 1.3 Free air cooled engines need a hole in bulkhead to allow to allow cooling air movement able to be closed in flight in case of fire. This is an EMERGENCY CONTROL and therefore must be marked in RED, if it applies.
- 1.4 C.G. CAUTION: if fan cooled, aircraft c.g. is satisfactory, BUT NOT WITH ELECTRIC START.

2. Mods required during release of aeroplane.

- 2.1 As listed above and Appendix 1.

3. Inspection highlights

- 3.1 See notes above in 1 and 2, check applicability and see Appendix 1.
- 3.2 Check control cable fouling against seat on stbd side.
- 3.3 Check propeller shaft (output shaft) for any sign of cracking, corrosion or stress. See 4.1.
- 3.4 Check engine front mounting plate for fatigue cracks around bolt holes. Also on Rotax 503 with 3.5:1 reduction a thorough inspection of all the engine mounting components and their attachment points on the airframe is particularly emphasised.
- 3.5 Check exhaust back-up wiring and check for loose baffles and cracks.
- 3.6 Control column, (a) check bearings for wear and (b) check control column/torque tube bolt.
- 3.7 Control surfaces: Check adhesive holding heat shrink coverings to tailplane, rudder and ailerons, where this system is used (see 4.2).
- 3.8 Fuselage structure: Check the junction of the three fuselage tubes at tail, particularly for bent bolts and any other deformation.
- 3.9 Jury strut connection, ensure that this is satisfactory, with reference to 4.4.
- 3.10 Check c.g. is correct for the loading conditions of the individual aeroplane. See Appendix 1

4. Specification notes

- 4.1 Output propeller shaft material is S96
- 4.2 In accordance with design submissions, the tailplane, rudder and ailerons can be recovered in a standard Ceconite/dope system, subject to compliance with the material manufacturer's specifications and satisfactory inspection.
- 4.3 Weight notes:- based upon DRAGON 200:-  
Some Dragon 200s (export versions) weighed 200 kg empty which is 20 kg greater than recommended by submission for 2 x 90 kg occupants.

Structurally the Dragon 150 has been submitted as capable of operating at 384 kg Max T-O Weight. Confirmation that this applies to the Dragon 150 has been provided by designer Bill Brooks and is as given in submission to BCAR S (CCL, load test reports, calculations, etc., and check analysis).

It is noted from later inputs from owners of examples of variants of Dragons that empty weights vary from approximately 150 kg to 200 kg. The Dragon 200 has an empty weight of up to 200 kg (agreed/accepted by CAA to Mr. B Cosgrove., BMAA Chief Executive for the Dragon 200, ref W Brooks to CAA 10 June 1986). The submissions indicate that both versions are satisfactory for operation at up to 384 kg, subject to c.g. and *subject to satisfactory performance*.

- 4.4 Note that jury struts are reported to help transmit positive loads between wing spars and struts and are not merely to jury the struts in the negative case.
- 4.5 Engine mounting torque capability, as proven by submissions, allows for reduction ratio up to 3.35:1; however, experience indicates that at 3.5:1 it has proven acceptable for a number of years with the Rotax 503 engine, subject to regular inspection of engine mounts.
- 4.6 Fuel to 20 kg (6 gallons 28 litres)

5. Flight Testing

- 5.1 (a) The stall speed at maximum authorised weight is to be checked for each aeroplane and recorded (as IAS).
- (b) In co-operation with the responsible inspector, the tailplane incidence is then adjusted (if necessary) to give a "hands-off" trim speed which is 1.3 to 1.5 x recorded stall speed as (a).